

## FOLDED FIN MICROCHANNEL HEAT EXCHANGER

### Abstract

Folded fin microchannel heat exchangers for cooling integrated circuit (IC) dies and packages and cooling systems employing the same are disclosed. The heat exchangers include a folded fin enclosed within the heat exchanger thereby defining a plurality of microchannels. In one embodiment, a folded fin microchannel heat exchanger is operatively coupled to an IC die or IC package using fasteners and is thermally coupled to the IC die or an IC package using a thermal interface material.

10 In other embodiments, a folded fin microchannel heat exchanger is operatively and thermally coupled to an IC die or an IC package using a thermal epoxy or a solderable material. The folded fin microchannel heat exchangers may be employed in a closed loop cooling system includes a pump and a heat rejecter. The folded fin microchannels are configured to support either a two-phase or a single-phase heat

15 transfer process using a working fluid such as water.